

EXHIBIT A

Alan C. Heffner, MD**Personal**

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Birthdate [REDACTED]
 Gainesboro, TN; Jackson County

Citizenship United States of America

Education

Fellowship	University of Pittsburgh Medical Center Pittsburgh, PA Department of Critical Care Medicine Multidisciplinary Critical Care Training Program	7/2005-6/2007
	NIH National Research Service Award (T-32) Fellowship University of Pittsburgh Medical Center Department of Critical Care Medicine	8/2006-6/2007
Internship Residency	Carolinas Medical Center Charlotte, NC Department of Emergency Medicine • Chief Resident 1999-2000	7/1997-7/2000
Medical	Medical College of Virginia Virginia Commonwealth University, Richmond, VA	8/1993-6/1997
College	James Madison University Harrisonburg, VA B.S. Biology	8/1988-6/1992

Appointments

Current:

Medical-Surgical Intensivist
Emergency Physician

Co-Director of Critical Care
Director of ECMO Services
HealthCare System Sepsis Medical Director

Carolinas Medical Center 7/2007-present
Pulmonary and Critical Care Consultants
Department of Internal Medicine
Department of Emergency Medicine

Surgical Critical Care Fellowship Faculty 2010-present

Professor of Internal Medicine and Emergency Medicine 2017-present
Carolinas HealthCare System

Associate Professor at Carolinas HealthCare System 2013-2017
Assistant Professor at Carolinas HealthCare System 2007-2013

Clinical Associate Professor 2013-present
Clinical Assistant Professor 2007-2013
University of North Carolina School of Medicine

Mercy Hospital, Pittsburgh, PA 7/2006-7/2007
Mercy Critical Care Associates
Medical-surgical Intensivist

Naval Medical Center Portsmouth 7/2000-6/2005
Portsmouth, VA
Department of Emergency Medicine
Faculty; Lieutenant Commander

- Assistant Residency Director and Education Coordinator 2002-2003
- Intern Coordinator 2000-2002

Medical College of Virginia / Virginia Commonwealth University 11/2000-8/2003
Richmond, VA
Department of Emergency Medicine
Clinical instructor

Certification

ABEM Internal Medicine – Critical Care Medicine Certification 2013

American Board of Emergency Medicine (ABEM) #200314 Recertification 2011

Neurocritical Care Certificate 2010
United Council for Neurologic Subspecialties (UCNS)

Diploma in Intensive Care Medicine (EDIC) 2009
European Society of Intensive Care Medicine (ESICM)

American Board of Emergency Medicine (ABEM) #200314	2001
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Additional Training

Carolinas HealthCare System Co-Leadership Institute	2016
Carolinas HealthCare System Physician Leadership Institute Queens University McColl School of Business	2013
Emergency Neurologic Life Support (ENLS)	2016, 2012
US Marine Corps Mountain Warfare Survival Medicine Training	2003
US Army Medical Management of Chemical/Biological Casualties Course	2002
Advanced Cardiac Life Support (ACLS) Instructor 2000-2007	1997-present
Advanced Trauma Life Support (ATLS)	1997-2013

Individual Honors and Awards

Fellow of Critical Care Medicine (FCCM) American Academy of Critical Care Medicine Society of Critical Care Medicine	2016
Lecturer of the Year Award Integrated Simulation Curriculum Program UNC School of Medicine – Charlotte Campus	2015
American Academy of Family Physicians (AAFP) Teaching Award Resident selection for exemplary teaching	2015
Vanguard Award for medical education Edwards Lifesciences	2010
Top Doctors in Charlotte Charlotte Magazine, Peer selected	2016, 2014, 2012, 2011, 2010
Fellow of the Year University of Pittsburgh Medical Center, Department of Critical Care Medicine	2006
Clinical Teaching Recognition Award School of Medicine, University of Pittsburgh	2006
Outstanding Faculty Teaching Award Naval Medical Center Portsmouth, Department of Emergency Medicine	2005
Outstanding Faculty Teaching Award Naval Medical Center Portsmouth, Department of Emergency Medicine	2004
Navy and Marine Corps Commendation Medal For contributions as faculty; Naval Medical Center Portsmouth	2004

Outstanding Faculty Teaching Award Naval Medical Center Portsmouth, Department of Emergency Medicine	2003
SAEM Clinical Pathological Case (CPC) Competition Best Discussant; Regional Semi-Finalist	2003
Combat Action Ribbon Navy and Marine Corps Achievement Medal Operation Enduring Freedom, Afghanistan	2002
Hospital Physician Teacher of the Year Naval Medical Center Portsmouth	2001
Outstanding Resident Teaching Award Carolinas Medical Center, Department of Emergency Medicine	2000
Alpha Omega Alpha Honor Medical Society Student president, Brown-Sequard Chapter; 1996-1997	1996
MCV School of Medicine Aesculapian Scholar	1995
Sidney-Barham Scholarship Award	1995
Aubrey H. Straus Microbiology Award	1995
Adolph D. Williams Scholarship Award (highest class rank)	1994

Institutional Honors and Awards

Sepsis Heroes Award Sepsis Alliance	2015
ELSO Award for Excellence in Life Support Extracorporeal Life Support Organization (ELSO)	2014
ELSO Award for Excellence in Life Support Extracorporeal Life Support Organization (ELSO)	2012
Joint Commission Ernest Amory Codman Award for Carolinas Medical Center <i>Code Sepsis</i> program	2008

Bibliography

Chapters

44. Placement of Femoral Venous Catheters
Androes MP, Heffner AC,
In: UpToDate, 2016
43. Extracorporeal Life Support
Kerns R, Heffner AC
In: Critical Care Toxicology, 2nd Edition
Brent J, Hatten B, Burkhart K, et al. Springer Press; 2016
42. The Unstable Patient: Optimization for Emergency Airway Management
Mosier, JM, Heffner AC, Sakles JC
In: Manual of Emergency Airway Management; 5th Edition
Walls RM and Murphy MF. Lippincott Williams & Wilkins; In press 2016

41. Anesthesia and Sedation for Awake Intubation
Heffner AC, DeBlieux PMC
 In: Manual of Emergency Airway Management; 5th Edition
 Walls RM and Murphy MF. Lippincott Williams & Wilkins; In press 2016
40. Flexible Endoscopic Intubation
Heffner AC, DeBlieux PMC
 In: Manual of Emergency Airway Management; 5th Edition
 Walls RM and Murphy MF. Lippincott Williams & Wilkins; In press 2016
39. Noninvasive Ventilation
Heffner AC, DeBlieux PMC
 In: Manual of Emergency Airway Management; 5th Edition
 Walls RM and Murphy MF. Lippincott Williams & Wilkins; In press 2016
38. Mechanical Ventilation
Heffner AC, DeBlieux PMC
 In: Manual of Emergency Airway Management; 5th Edition
 Walls RM and Murphy MF. Lippincott Williams & Wilkins; In press 2016
37. Overview of Central Venous Access
Heffner AC, Androes MP
 In: UpToDate, 2016
36. Thoracentesis
 Jefferson B, Heffner AC
 In: Interventional Critical Care: A manual for Advanced Care Practitioners
 Taylor D et al. Springer International, 1st Ed, 2016
35. Complicated Skin and Soft Tissue Infections
 Carlson CG, Heffner AC
 In: Acute Critical Care, 1st Ed
 Shiber J et al. Springer Press; In press 2016
34. Fluid Management in Critical Illness
Heffner AC, Robinson MT
 In: Emergency Department Resuscitation of the Critically Ill; 2nd Edition
 Winters ME et al. American College of Emergency Physicians (ACEP); In press 2016
33. Severe Sepsis and Septic Shock
Heffner AC
 In: Emergency Department Resuscitation of the Critically Ill; 2nd Edition
 Winters ME et al. American College of Emergency Physicians (ACEP); In press 2016
32. Fluid Management of Critical Illness
Heffner AC, Robinson MT
 In: Critical Care Emergency Medicine; 2nd Edition
 Farcy DA et al. McGraw-Hill Professional, 2016
31. Extracorporeal Life Support
 Farcy DA, Heffner AC, Napolitano L
 In: Critical Care Emergency Medicine; 2nd Edition
 Farcy DA et al. McGraw-Hill Professional, 2016
30. Post-Cardiac Arrest Management
Heffner AC, Pearson DA
 In: Critical Care Emergency Medicine; 2nd Edition
 Farcy DA et al. McGraw-Hill Professional, 2016

29. Emergency Pericardiocentesis
Heffner AC
In: UpToDate. 2015
28. Monoarticular Arthritis
Heffner AC
In: The Clinical Practice of Emergency Medicine, 6th Edition
Harwood-Nuss et al. Lippincott Williams & Wilkins. 2014
27. Sepsis and Shock with Infection
Jones AE, Heffner AC
In: Emergency Department Critical Care
Yealy DM and Callaway C. Oxford University Press. 2013
26. Placement of Femoral Venous Catheters
Heffner AC, Androes MP
In: UpToDate. 2013
25. Placement of Subclavian Venous Catheters
Heffner AC, Androes MP
In: UpToDate. 2013
24. Placement of Jugular Central Venous Catheters
Heffner AC, Androes MP
In: UpToDate. 2013
22. Emergency Pericardiocentesis
Heffner AC
In: UpToDate. 2013
23. Overview of Central Venous Access
Heffner AC, Androes MP
In: UpToDate. 2013
21. Anesthesia and Sedation for Awake Intubation
Heffner AC, DeBlieux PMC
In: Manual of Emergency Airway Management; 4th Edition
Walls RM and Murphy MF. Lippincott Williams & Wilkins 2012
20. Oxygen and Carbon Dioxide Monitoring
Heffner AC, Reardon RF
In: Manual of Emergency Airway Management; 4th Edition
Walls RM and Murphy MF. Lippincott Williams & Wilkins 2012
19. The Patient in Shock
Heffner AC
In: Manual of Emergency Airway Management; 4th Edition
Walls RM and Murphy MF. Lippincott Williams & Wilkins 2012
18. Mechanical Ventilation
DeBlieux PMC, Heffner AC
In: Manual of Emergency Airway Management; 4th Edition
Walls RM and Murphy MF. Lippincott Williams & Wilkins 2012
17. Acid-Base Disorders
Robinson M, Heffner AC
In: Emergency Medicine, 2nd Edition
Adams JG et al. Elsevier Health Sciences; 2012
16. Fluid Management
Heffner AC, Robinson M
In: Emergency Medicine, 2nd Edition
Adams JG et al. Elsevier Health Sciences; 2012

15. Severe Sepsis and Septic Shock
Heffner AC
In: Emergency Department Resuscitation of the Critically Ill
American College of Emergency Physicians (ACEP); 2011
14. Fluid Management in Critical Illness
Heffner AC, Robinson MT
In: Emergency Department Resuscitation of the Critically Ill
American College of Emergency Physicians (ACEP); 2011
13. Emergency Pericardiocentesis
Heffner AC
In: UpToDate. 2011
12. Fluid Management of Critical Illness
Heffner AC, Robinson MT
In: Critical Care Emergency Medicine, 1st Edition
Farcy DA et al. McGraw-Hill Professional; 2011
11. Post-Cardiac Arrest Management
Heffner AC
In: Critical Care Emergency Medicine, 1st Edition
Farcy DA et al. McGraw-Hill Professional; 2011
10. Acid-Base Disorders
Robinson M, Heffner AC
In: Emergency Medicine, 2nd Edition
Adams JG et al. Elsevier Health Sciences; 2011
9. Fluid Management
Heffner AC, Robinson M
In: Emergency Medicine, 2nd Edition
Adams JG et al. Elsevier Health Sciences; 2011
8. Diagnosis and Therapy of Metabolic Alkalosis
Heffner AC, Murugan R, Madden N, et al.
In: Critical Care Nephrology; 2nd Edition
Ronco C et al. Saunders Elsevier; 2009
7. Monoarticular Arthritis
Heffner AC
In: The Clinical Practice of Emergency Medicine, 5th Edition.
Wolfson AB et al. Lippincott Williams & Wilkins; 2010
6. Fluid Management
Heffner AC, Robinson M
In: Emergency Medicine, 1st Edition
Adams JG et al. Elsevier Health Sciences; 2008
5. Acid-Base Disorders
Robinson M, Heffner AC
In: Emergency Medicine, 1st Edition
Adams JG et al. Elsevier Health Sciences; 2008
4. Central Venous Access
Heffner AC
In: UpToDate. 2007
3. Monoarticular Arthritis
Heffner AC
In: The Clinical Practice of Emergency Medicine, 4th Edition.
Wolfson AB et al. Lippincott Williams & Wilkins; 2005

2. Esophageal Foreign Bodies
Munter D, Heffner A
In: Clinical Procedures in Emergency Medicine, 4th Edition
Roberts JR and Hedges J. W.B. Saunders Company; 2003
1. Monoarticular Arthritis
Heffner AC
In: The Clinical Practice of Emergency Medicine, 3rd Edition
Harwood-Nuss et al. Lippincott Williams & Wilkins; 2001

Refereed Original Contributions

23. Missed opportunities? An evaluation of potentially preventable poisoning deaths
Srisuma S, Cao D, Kleinschmidt K, Heffner AC, Lavonas EJ
Clin Toxicol. 2016 March 21;1-6. PMID 26998958
22. Early neurologic exam is not reliable for prognostication in post-cardiac arrest patients who undergo therapeutic hypothermia
Merrill MS, Wares CM, Heffner AC, et al
Am J Emerg Med. 2016 June; 34(6):975-9. PMID 26994681
21. Urinary obstruction is a common and important complication of septic shock due to urinary infection
Reyner K, Heffner AC, Karvetski C
Am J Emerg Med. 2016 April; 34(4):694-6. PMID 26905806
20. Troponin marker for acute coronary occlusion and patient outcome following cardiac arrest
Pearson DA, Wares CM, Mayer KA, Runyon MS, Studnek JR, Kraft KM, Heffner AC
West J Emerg Med. 2015 Dec;16(7):1007-13. PMID 26759645
19. Outcomes in cardiac arrest patients due to toxic exposure treated with therapeutic hypothermia
Modisett KL, Walsh SJ, Heffner AC, et al.
J Med Tox. 2016 Feb 8; Epub ahead of print. PMID 26856349
18. Early treatment of severe acute respiratory distress syndrome
Przybsz TM, Heffner AC
Emerg Med Clin North Am. 2016 Feb;(34)1:1-14. PMID 26614238
17. Part 10: Special Circumstances of Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
Lavonas EJ, Drennan IR, Gabrielli A, Heffner AC, Hoyte CO, Orkin AM, Sawyer KN, Donnino WM
Circulation. 2015 Nov; 132(18 Suppl 2):S501-18. PMID 26472998
16. Effect of prehospital initiation of therapeutic hypothermia in adults with cardiac arrest on time-to-target temperature
Schenfeld EM, Studnek, J, Heffner AC, et al.
Can J Emerg Med. 2015 May 1;17(3):240-247. PMID 26034909
15. Cardiac arrest with initial rhythm of pulseless electrical activity: do rhythm characteristics correlate with outcome?
Hauck M, Studnek, J, Heffner AC, et al.
Am J Emerg Med. 2015 July 33(7);891-894. PMID 25943040
14. ED prognostication of comatose cardiac arrest patients undergoing therapeutic hypothermia is unreliable
Wares CM, Heffner AC, Ward SL, et al.
Am J Emerg Med. Jun 33(6);802-806. PMID 25858162

13. Incidence and factors associated with cardiac arrest complicating emergency airway management
Heffner AC, Swords DS, Neale MN, et al.
Resuscitation. 2013 Nov; 84(11):1500-1504. PMID 23911630
12. Practical Aspects of Post Cardiac Arrest Therapeutic Hypothermia
 Pearson DA, Heffner AC
EM Critical Care 2013 June; 3(3).
11. Whole blood lactate kinetics in patients undergoing quantitative resuscitation for severe sepsis and septic shock
 Puskarich MA, Trzeciak S, Shapiro NI, et al. (#5)
Chest. 2013. 142(6):1548-1553. PMID 23740148
10. Regionalization of Post-Cardiac Arrest Care: Implementation of a Cardiac Resuscitation Center
Heffner AC, Pearson DA, Nussbaum M, Jones AE
Amer Heart Journal. 2012 Oct; 164(4):493-501. PMID 23067906
9. Predictors of the complication of post-intubation hypotension during emergency airway management
Heffner AC, Swords D, Nussbaum M, Kline JA, Jones AE
J Crit Care. 2012 July; 27(6):587-593. PMID 22762924
8. Prognostic value and agreement of achieving lactate clearance or central venous oxygen saturation goals during early sepsis resuscitation
 Puskarich MA, Trzeciak S, Shapiro NI, et al (#5)
Acad Emergency Med. 2012; 19(3):252-258. PMID 22435856
7. The frequency and significance of post-intubation hypotension during emergency airway management
Heffner AC, Swords, D, Kline JA, Jones AE
J Crit Care. 2012 Aug; 27(4):417.e9-13. PMID 22033053
6. Outcomes of patients undergoing early sepsis resuscitation for cryptic shock compared to overt shock
 Puskarich MA, Trzeciak S, Shapiro NI, et al (#4)
Resuscitation. 2011;(82):1289-1293. PMID 21752522
5. The association between intra-arrest therapeutic hypothermia and return of spontaneous circulation among individuals experiencing out of hospital cardiac arrest.
 Garrett JS, Studnek JR, Blackwell T, et al (#6)
Resuscitation. 2011;82(1):21-25.
4. Etiology of illness in patients admitted to the hospital from the emergency department with severe sepsis.
Heffner AC, Horton JM, Marchick MR, Jones AE
Clin Infect Dis. 2010 Mar 15;50(6):814-20.
3. The effects of a quantitative resuscitation strategy on mortality in patients with sepsis: A meta-analysis.
 Jones AE, Brown M, Trzeciak S, et al (#6)
Crit Care Med. 2008;36(10):2734-9.
2. Characteristics of Women with Fetal Loss in Symptomatic First Trimester Pregnancies with Documented Fetal Cardiac Activity
 Juliano M, Dabulis S, Heffner A
Ann Emerg Med. 2008 Aug; 52(2):143-7.
1. Role of the Peripheral Intravenous Catheter in False-Positive D-Dimer Testing
Heffner A, Kline J
Acad Emerg Med. 2001 Feb;8(2):103-6.

Original Contributions – Case Reports Reviewed

5. Successful use of intra-arrest thrombolysis for electrical storm due to acute myocardial infarction
Reyner K, Heffner AC, Garvey L, Tayal V
Am J Emerg Med. July;33(7):990.e5-8. PMID 25797864
4. Major hemorrhage from hepatic laceration after cardiopulmonary resuscitation
Zahn G, Haugk M Pearson DA, Heffner AC
Am J Emerg Med. July;33(7):990.e3-4. PMID 25680562
3. Successful outcome utilizing hypothermia after cardiac arrest in pregnancy
Rittenberger JC, Kelly E, Jang D, Greer K, Heffner A
Crit Care Med. 2008;36(4):1354-6. PMID 18379264
2. A Case of Lactation “Bovine” Ketoacidosis
Heffner AC, Johnson DP
J Emerg Med. 2007 Nov;35(4):385-7.
1. Treatment of severe carbon monoxide poisoning using a portable hyperbaric oxygen chamber
Lueken RJ, Heffner AC, Parks PD
Ann Emerg Med. 2006 Sep;48(3):319-22.

Editorials

1. Therapeutic Cooling Saves Lives; Time to Get on Board!
Heffner AC, Winters ME
Emergency Medicine News. 2012 May;34(5B)
2. Trials stopped early for benefit? Not so fast!
Heffner AC, Milbrandt EB, Venkataraman R
Crit Care. 2007 Feb 22;11(1):305.

Multi-media Works

4. Fluid Management
EM Rap Audio Discussion, February 2011
3. Flexible Fiberoptic Intubation
Airway World Video Module, 2010
2. PhotoStim Visual Diagnosis Cases
Government Services ACEP Joint Services Symposium, March 2001
1. PhotoStim Visual Diagnosis Cases
Virginia ACEP Symposium, July 2001

Media Interviews and Contributions

5. How to scale sepsis across an entire health system
The Advisory Board, Oct 2014
4. Arresting Sepsis Saves Money, Lives
HealthLeader, June 2014
3. Charlotte Hospital Takes Part in Global Study of Sepsis
Charlotte National Public Radio (NPR), Nov 2013
2. Omar Carter’s Odyssey
Charlotte Observer, July 2013
1. ‘Code Cool’ saves woman, unborn child
WCNC News, June 2010

Teaching Record**Course Faculty**

Difficult Airway Course - Critical Care™ National Course Instructor and Lecturer	2015-present
Intern Simulation Common Critical Care Curriculum (4C) Program Carolinas HealthCare System, Charlotte, NC	2014-present
Critical Points™ Early Impact Critical Care National Course Instructor	2009-present
Difficult Airway Course - Emergency™ National Course Instructor and Lecturer	2007-present
Carolinas Emergency Medicine Oral Board Review Course Course Instructor, Charlotte, NC	2001-2003

Research Grant Investigation Contributions

7. A Prospective, Randomized, Double-Blind, Multicenter, Phase 3 Study to Assess the Safety and Efficacy of Intravenous Ceftolozane/Tazobactam compared with Meropenem in Adult Patients with Ventilated Nosocomial Pneumonia (ASPECT) 4/2016-present
Industry sponsored grant - Cubist/Merck
PI: Polk CM, Role: Sub-Investigator
6. Randomized open label, multicenter, controlled study to assess safety and efficacy of ELAD® in subjects with acute alcoholic hepatitis who have failed steroid therapy
Industry sponsored grant - Vital Therapies Incorporated 2013-2015
PI: deLemos AS, Role: Sub-Investigator
5. L-Carnitine Treatment for Vasopressor Dependent Septic Shock 2012-present
NIH – National Institute of General Medical Sciences; 1R01GM103799-01
PI: Jones AE; Role: Sub-Investigator
4. Procalcitonin Decrease Over 72 Hours and Outcome in Patients with Severe Sepsis or Septic Shock 2011-2014
Industry sponsored grant - Brahms, GmbH Global Medical Affairs
PI: Runyon M; Role: Sub-Investigator
3. Randomized Trial of Tenecteplase to Treat Submassive Pulmonary Embolism
Investigator Initiated Grant - Genentech 2008-2012
PI: Kline JA; Role: Co-Investigator
2. L-Carnitine Administration in Early Sepsis 2010-2012
AHA Post-Doctoral Fellow Grant; 10POST3560001
PI: Puskarich M, Role: Co-Investigator
1. Rapid Administration of Insulin in Sepsis 2009-2010
Internally funded Grant - Carolinas HealthCare System
PI: Jones AE; Role: Co-Investigator

Professional Activities and Services

Society of Critical Care Medicine (SCCM)	
Abstract Reviewer, 46 th Critical Care Congress	2016
Poster Moderator, 45 th Critical Care Congress	2016
Abstract Reviewer, 45 th Critical Care Congress	2015
Abstract Reviewer, 44 th Critical Care Congress	2014
Faculty , 43 rd Critical Care Congress	2014
Poster Moderator, 43 rd Critical Care Congress	2014
Poster Moderator, 42 st Critical Care Congress	2013
Abstract Reviewer, 42 nd Critical Care Congress	2012
Emergency Medicine Section Member at Large	2012-2015
Faculty , 41 st Critical Care Congress	2012
Poster Moderator, 41 st Critical Care Congress	2012
Abstract Reviewer, 41 st Critical Care Congress	2011
Abstract Reviewer, 40 th Critical Care Congress	2010
Carolinas / Virginias Chapter Board of Directors	2009-2014
Fundamental Critical Care Support (FCCS) Instructor	2008-2012
American College of Emergency Physicians (ACEP)	
Faculty , ACEP Scientific Assembly	2016
Faculty , ACEP Scientific Assembly	2014
Faculty , ACEP Scientific Assembly	2013
Oral Presentation Moderator, ACEP Scientific Assembly	2013
Faculty , ACEP Scientific Assembly	2012
Poster Moderator, ACEP Scientific Assembly	2012
Abstract Reviewer, ACEP Scientific Assembly	2012
American Heart Association (AHA)	
2015 Guidelines Writing Committee for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care	2014-2015
Society of Academic Emergency Medicine (SAEM)	
Clinical Pathologic Case Conference Committee	2003-2005

Editorial and Review Activities

20. <i>Circulation</i>	2016
Invited ad hoc reviewer	
19. <i>Canadian Journal of Emergency Medicine</i>	2015
Invited ad hoc reviewer	
18. <i>Journal of Critical Care</i>	2014-present
Manuscript reviewer	
17. The Advisory Board Company	2014-present
Consultant on Advisory Board Sepsis Collaborative	
16. <i>Circulation</i>	2014
Invited ad hoc reviewer	
15. <i>American Journal of Emergency Medicine</i>	2014-present
Manuscript reviewer	
14. <i>Circulation: Cardiovascular Interventions</i>	2014
Invited ad hoc reviewer	
13. <i>Analgesia and Resuscitation: Current Research</i>	2014
Invited ad hoc reviewer	

12. <i>Airway Management SciTechnol</i>	2014
Invited ad hoc reviewer	
11. <i>International Journal of General Medicine</i>	2014
Invited ad hoc reviewer	
10. <i>Risk Management and Healthcare Policy</i>	2013
Invited ad hoc reviewer	
9. Elsevier <i>First Consult</i>	2013
Invited ad hoc reviewer	
8. <i>Critical Care Nurse</i>	2013
Invited ad hoc reviewer	
7. <i>Journal of Medical Toxicology</i>	2011-present
Manuscript reviewer	
6. <i>Journal of Emergency Medicine</i>	2011-present
Manuscript reviewer	
5. <i>Hospital Practice</i>	2011
Invited ad hoc reviewer	
4. <i>Academic Emergency Medicine</i>	2010-present
Manuscript reviewer	
3. McMaster University Online Rating of Evidence (MORE)	2009-present
Critical care and emergency medicine reviewer	
2. <i>Academic Emergency Medicine</i>	2007
Invited ad hoc reviewer	
1. <i>Critical Care Medicine</i>	2007-present
Manuscript reviewer	

CHS Committee Activities

Carolinas HealthCare System

Sepsis Initiative Medical Director	2013-present
Critical Care Network Leadership Council	2013-present
ICU Models of Care; Co-Chair	2011-present

Carolinas Medical Center

Critical Care Co-Director	2016-present
PCCC Critical Care Director	2016
Root Cause Analysis Physician Leader	2016
Medical Executive Committee	2016-present
Sentinel Event Leadership Team	2013-present
Neuro-ICU Associate Director	2012-present
Neuro-ICU Operations Committee	2012-present
Infection Prevention Committee	2012-present
Emergency Medicine - Critical Care Curriculum Leader	2012-2014
Sentinel Event Task Force	2011
Director of ECMO Services	2010-present
Medical ICU Medical Director	2009-present
Code Blue Committee Chair	2009-2013
Rapid Response Team Director	2009-2013
Organ and Tissue Donation Committee Co-Chair	2009-2014
Quality Assessment and Improvement Committee	2009-2013
Intensive Care Advisory Committee	2009-2016
Surgical Critical Care Outcomes Committee	2009-present
Surgical Critical Care Fellowship Committee	2009-present

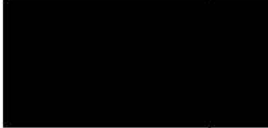
Infection Control Committee	2008-2011
Therapeutic Hypothermia "Code Cool" Co-Director	2007-present
Code Sepsis Committee Leader	2007-present
Trauma Outcomes Committee	2007-2014
Code Blue Committee	2007-present
Organ and Tissue Donation Committee	2007-present
Pulmonary & Critical Care Consultants Education Committee	2007-present
MICU Blood Product Utilization QI Leader	2007-2009
 Pulmonary and Critical Care Consultants	
Critical Care Director	2015-present
Steering Committee	2010-present
 Naval Medical Center Portsmouth	
Code Blue Committee	2000-2003

Testimonial History for Alan C. Heffner, MD.

Year	Lawyer / Firm	Case	Topic
2013	Claire Modlin: McGuire Woods LLP	v. Gaillard and Baptist Hospital	Post-extubation failure with CA
2015	Shirley DeLuna: Billing, Cochrane, Lyles...	Silkworth v. Boca Raton Regional Hospital	MVC, L/S Fx, cord injury
2016	Jack Gresh: Hall, Booth, Smith, Charleston, SC	Gatrell v. Aiken MC, Carter	Flu, MRSA PNA, sepsis, limb injury

EXHIBIT B

Alan C. Heffner, MD



5 March 2017

Shawn F. Brousseau
Napierski, VanDenburgh, Napierski & O'Connor, LLP
296 Washington Avenue Extension, Suite 3
Albany, NY 12203

Re: Written report of expert opinion by Alan C. Heffner, MD
Case Claim No.: 30722822, NVNO File No.: 05779

Dear Mr. Brousseau,

Per our prior agreement, I am engaged by the law firm of Napierski, VanDenburgh and Napierski, LLP of Albany, NY to review records and render an opinion on the care in the case of John C. Breitenbach, Jr as Administrator of the estate of Deborah Breitenbach (herein referred to as patient) v. Nancy A. Caffrey, RPA-C, Moses-Ludington Hospital and Inter-Lakes Health, Inc. To that end, I have reviewed the following materials:

- Medical records from Moses-Ludington Hospital
- Medical records from Lamoille Ambulance Service
- Medical records from Fletcher Allen Health Care (University of Vermont Medical Center, Burlington, VT)
- Medical records from Hudson Headwaters
- Plaintiff's Second Amended Complaint
- Plaintiff's expert witness disclosure

My qualifications for this review include the practice of emergency medicine and critical care medicine and special interest and experience in emergency airway management (see CV enclosed). Expert review rate for this work is \$300 per hour and \$3500 per day of testimony. A description of expert testimony over the preceding four years is enclosed. I certify that my opinions have never been disqualified in court and I have not been found guilty of fraud or perjury in any jurisdiction. All opinions contained in this report are stated to a reasonable degree of medical certainty.

Case chronology

The patient is a 60-year-old female with hypertension and hypercholesterolemia who presented to Moses Ludington Hospital Emergency Department at 08:55 on 4/21/2014 with chief complaint of "aspirin stuck in throat".

She was evaluated by Nancy A. Caffrey, RPA-C at 09:05 who performed a history and physical exam. Documentation details absence of respiratory symptoms or signs, normal pharynx, voice, and swallowing, and no cervical adenopathy or distress. The patient was discharged at 09:21 with the diagnosis of esophageal foreign body sensation following patient education and follow up instructions.

The patient returned to Ticonderoga Health Clinic at 18:47 with chief complaint of sore throat and headache. She reported throat pain and swelling with difficulty breathing and swallowing,

and endorsed fever and chills. Exam was notable for moderate distress, tachycardia, audible stridor, left face and neck swelling, and difficulty breathing. No treatment was provided.

The patient was referred to the Moses Ludington Emergency Department and arrived by private vehicle at 19:41 where she was evaluated by Nancy A. Caffrey, RPA-C. Chief complaint was "worsening sore throat and hoarseness". Initial exam was notable for ill appearance, hoarse and muffled voice, and tender neck swelling. Epiglottitis was suspected and diagnostic studies and treatment were initiated for this disease.

The case was discussed with an otolaryngology specialist (ENT) Dr. Hubbell, which distilled a plan for immediate transfer to Fletcher Allen Health Care.

Serial evaluations identified deteriorating status, marked by stridor and increased work of breathing. Transfer without airway management was deemed dangerous and Ms. Caffrey contacted Dr. Toni Sturm who evaluated the patient at 20:45 and discussed the case with Dr. Hubbell. They agreed on the priority to secure the patient's airway prior to inter-facility transport.

An airway management plan was devised and discussed prior to intervention which commenced at approximately 21:08.

Awake anesthetized visualization of the airway was complicated and the patient exhibited continued deterioration. Rapid sequence induction was performed. Visualization under these conditions was also complicated and attempted intubation resulted in esophageal intubation, that was immediately recognized. Rescue needle cricothyrotomy failed to provide adequate ventilation. Open surgical cricothyrotomy was undertaken with difficult placement of the endotracheal tube.

The patient deteriorated to cardiac arrest during attempts to secure the airway. Ultimately, open surgical cricothyrotomy was successful via passage of a 3-0 endotracheal tube. The patient was resuscitated from cardiac arrest.

Post intubation management provided by Ms. Caffrey and Dr. Sturm included securing the airway, surgical site hemostasis, management of hemodynamics, and initiation of therapeutic cooling.

The Lamoille Ambulance Service crew was dispatched to Moses Ludington Emergency Department for inter-facility transport of the patient at 20:36. They arrived at 20:46 and witnessed the critical patient situation and assisted with resuscitation.

Lamoille Ambulance Service left Moses Ludington Emergency Department with the patient at 23:00 and arrived at Fletcher Allen Health Care Emergency Department at 23:55.

Hypoxemic respiratory failure, shock and persistent coma were recognized in the emergency department and following hospital admission at Fletcher Allen Health Care.

ENT and anesthesia laryngoscopy attempts revealed distorted anatomy and difficult airway visualization with initial failed attempts at orotracheal intubation. Anesthesia performed orotracheal intubation with assistance of an airway bougie.

Serial exams and imaging in the hospital were consistent with anoxic brain injury. The family elected withdrawal of life support measures and donation after cardiac death which was performed on 4/22/14.

Standard of care

Standard of care for the first patient encounter required a complaint focused history and examination to evaluate for treatable or dangerous clinical conditions. Standard of care during the second patient encounter required recognition of the emergency condition of upper airway compromise and management of this condition. Standard of care for the management of rapidly evolving upper airway obstruction required recognition of a difficult airway situation and use of an organized airway management plan.

Opinions

1. The totality of care including important case features detailed below met or exceeded the prevailing standard of care for this clinical situation. Specifically:
2. The first emergency department evaluation was focused and appropriate for the patient's complaint. Cardinal features of serious upper airway disease, including epiglottitis and supraglottitis, were absent. Medical decision making highlighted a reasonable diagnosis. Management and discharge instructions were appropriate.
3. Patient management during the return emergency department encounter was correct and appropriate for the patient's clinical condition and available resources. Specifically:
4. Ms. Caffey quickly recognized the patient's acuity and suspected supraglottitis. Confirmatory diagnostic studies and initial treatment with intravenous fluids, antibiotics and steroids were timely and appropriate.
5. Consultation with the nearest off-site ENT specialist, with anticipation of transfer, was timely and appropriate.
6. Ms. Caffey exhibited insight in recognizing progressive patient deterioration marked by signs of critical airway compromise and impending airway obstruction. As such, the decision to delay patient transfer and attend to the patient's impending and life threatening airway obstruction was prudent and exemplified good medical judgment.
7. Real-time discussion with the off-site ENT specialist corroborated this plan. There were no additional on-site providers with more experience to handle the situation.
8. The team appropriately recognized the patient's clinical features and anticipated complicated upper airway anatomy and difficult airway management.
9. The team quickly developed a thoughtful step-wise airway management plan that started with awake anesthetized video laryngoscopy. Inadequate airway visualization and continued patient deterioration represented a forced to act scenario. Rapid sequence intubation was undertaken to optimize laryngoscopy view with a double set-up approach incorporating preparation for emergency cricothyrotomy. The patient's anterior neck landmarks were identified and marked prior to undertaking airway management. Although complicated, the

airway plan was executed in the anticipated sequence based on airway findings and patient condition. Bag-valve-mask was attempted during and between airway maneuvers. Per the plan, cricothyrotomy was attempted following failed laryngoscopy and thirteen minutes prior to cardiac arrest.

10. The high risk of patient deterioration during airway management was recognized *a priori*. Deterioration, including cardiac arrest, does not represent a deficiency in medical decision making, preparation or technical proficiency. Rather, the management of this rare and rapidly evolving emergency illustrate a thoughtful and deliberate strategy and plan execution.
11. Timely and appropriate post-intubation and post-cardiac arrest care that included cardiopulmonary support and therapeutic cooling exemplifies detailed attention to this critical patient.

Ms. Caffrey exhibited reasonable and appropriate medical judgment in the management of this patient. I believe a reasonably prudent medical provider would make the same decisions and take these same actions under similar circumstances.

These opinions may be revised based on additional case facts and information that becomes available.

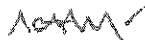
Pertinent literature and exhibits:

Woods, CR. Epiglottitis (supraglottitis): Clinical features and diagnosis
UpToDate; Wolters Kluwer. 2016

Manual of Emergency Airway Management, 4th Ed. Lippincott, Williams and Wilkins, 2012.

Additional exhibits may be provided.

Sincerely,



Alan C. Heffner, MD